

Formula 1

wherein W_1 and W_2 may be the same or different and are selected from the group consisting of $-CR^{10}R^{11}$, $-O-$, $-NR^{12}$, $-S-$, and $-Se$; Y_1 , Y_2 , Z_1 , and Z_2 are

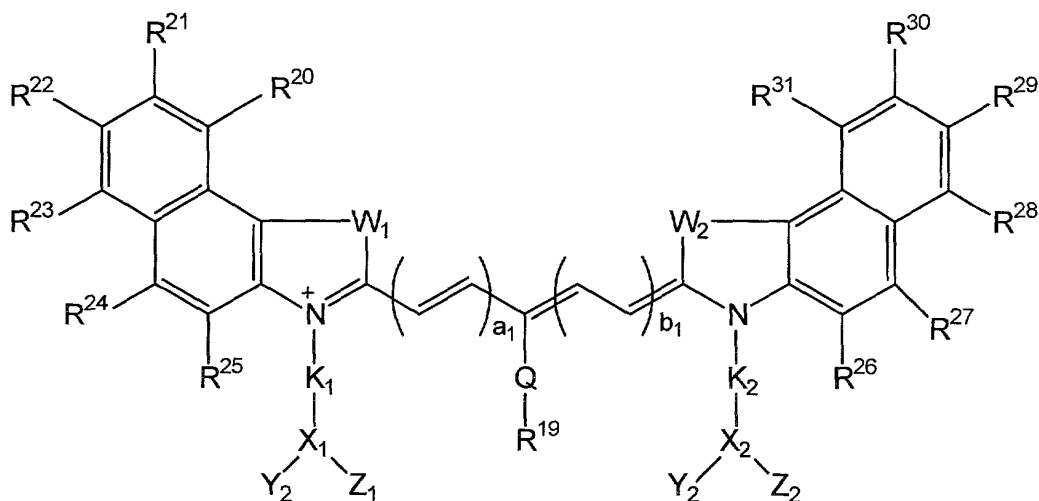
- 5 independently selected from the group consisting of hydrogen, tumor-specific agents, phototherapy agents, $-CONH-Bm$, $-NHCO-Bm$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-N(R^{12})-(CH_2)_b-CONH-Bm$, $-(CH_2)_a-N(R^{12})-(CH_2)_c-NHCO-Bm$, $-(CH_2)_a-N(R^{12})-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-N(R^{12})-CH_2-$
- 10 $(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-CH_2-(CH_2OCH_2)_d-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-CH_2-(CH_2OCH_2)_d-NHCO-Bm$, $-CONH-Dm$, $-NHCO-Dm$, $-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-(CH_2)_a-$

$N(R^{12})-(CH_2)_b-CONH-Dm$, $-(CH_2)_a-N(R^{12})-(CH_2)_c-NHCO-Dm$, $-(CH_2)_a-N(R^{12})-CH_2-$
 $(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-N(R^{12})-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$,
 $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-$
 $(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-CH_2-(CH_2OCH_2)_d-CONH-Dm$,
5 $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^{12})-CH_2-(CH_2OCH_2)_d-NHCO-Dm$, $-(CH_2)_a-N R^{12}R^{13}$,
and $-CH_2(CH_2OCH_2)_b-CH_2N R^{12}R^{13}$; K_1 and K_2 are independently selected from
the group consisting of C_1-C_{30} alkyl, C_5-C_{30} aryl, C_1-C_{30} alkoxy, C_1-C_{30}
polyalkoxyalkyl, C_1-C_{30} polyhydroxyalkyl, C_5-C_{30} polyhydroxyaryl, C_1-C_{30}
aminoalkyl, saccharides, peptides, $-CH_2(CH_2OCH_2)_b-CH_2-$, $-(CH_2)_a-CO-$, $-(CH_2)_a-$
10 $CONH-$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-$, $-(CH_2)_a-NHCO-$, $-CH_2-(CH_2OCH_2)_b-CH_2-$
 $NHCO-$, $-(CH_2)_a-O-$, and $-CH_2-(CH_2OCH_2)_b-CO-$; X_1 and X_2 are single bonds, or
are independently selected from the group consisting of nitrogen, saccharides,
 $-CR^{14}-$, $-CR^{14}R^{15}$, $-NR^{16}R^{17}$; C_5-C_{30} aryl; Q is a single bond or is selected from
the group consisting of $-O-$, $-S-$, $-Se-$, and $-NR^{18}$; a_1 and b_1 independently vary
15 from 0 to 5; R^1 to R^{13} , and R^{18} are independently selected from the group
consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxy, C_1-C_{10}
polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10}
aminoalkyl, cyano, nitro, halogens, saccharides, peptides, $-CH_2(CH_2OCH_2)_b-$
 CH_2-OH , $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$,
20 $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-OH$ and $-CH_2-$
 $(CH_2OCH_2)_b-CO_2H$; R^{14} to R^{17} are independently selected from the group
consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxy, C_1-C_{10}
polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10}
aminoalkyl, saccharides, peptides, $-CH_2(CH_2OCH_2)_b-CH_2-$, $-(CH_2)_a-CO-$, $-(CH_2)_a-$
25 $CONH-$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-$, $-(CH_2)_a-NHCO-$, $-CH_2-(CH_2OCH_2)_b-CH_2-$

- NHCO-, $-(CH_2)_a-O-$, and $-CH_2-(CH_2OCH_2)_b-CO-$; Bm and Dm are independently selected from the group consisting of bioactive peptides, proteins, cells, antibodies, antibody fragments, saccharides, glycopeptides, peptidomimetics, drugs, drug mimics, hormones, metal chelating agents, radioactive or
- 5 nonradioactive metal complexes, echogenic agents, photoactive molecules, and phototherapy agents (photosensitizers); a and c independently vary from 1 to 20; b and d independently vary from 1 to 100.

The invention also relates to the novel composition comprising carbocyanine dyes having a general formula 2

10



Formula 2